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ABSTRACT

New corporate practices and strategies, technological advances and rising job skill requirements are making postsecondary training a virtual necessity for a high-paying job. This is driving a wedge between the earnings of education "haves" and "have nots." Corporate restructuring is eliminating hundreds of thousands of jobs, many of which belong to professionals and managers, but at the same time it is creating many different kinds of jobs. Kentucky may have a more serious problem with worker layoffs than other states because a larger share of its workforce is employed in occupations that are not growing quickly and because these workers do not have as much success finding new employment after a layoff. New employment might be found in technical jobs, particularly in health care, which will be among the fastest growing occupations in the coming years. Rural areas in Kentucky are already seeing rapid growth in these occupations. Four positive qualities of the digital age--decentralization, globalization, harmonization, and empowerment--have the potential to bring untapped opportunities to rural areas, such as Kentucky, because they enable professionals to live in rural areas and do their work at home. To ensure that Kentucky will thrive in the new economy, it is essential that workers and businesses have modern hardware and software which allow them to work and learn and conduct business over the Internet. College and other postsecondary education is also essential. (Contains 4 tables, 3 figures, and 48 footnotes.) (TD)

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Occupational Trends: Education, Technology, Trade, and Corporate Restructuring

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Occupational Trends: Education, Technology, Trade, and Corporate Restructuring

New corporate practices and strategies, technological advances and rising job skill requirements are making postsecondary training a virtual necessity for a high-paying job. This is driving a wedge between the earnings of education "haves" and "have nots." Corporate restructuring is eliminating hundreds of thousands of jobs, many of which belong to professionals and managers, but at the same time it is creating many different kinds of jobs. Kentucky may have a more serious problem with worker layoffs than other states because a larger share of our workforce is employed in occupations which are not growing quickly and because these workers do not have as much success finding new employment after a layoff. New employment might be found in technical jobs, particularly in health care, which will be among the fastest growing occupations in the coming years. Rural areas in Kentucky are already seeing rapid growth in these occupations.

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In the previous chapter, we looked at changes in the industrial structure of the United States and Kentucky. In this chapter, we look at occupations in the rapidly changing, globally competitive, technologically advanced, service-based economy. New corporate practices and strategies, technological advances and rising job skill requirements are making postsecondary training a virtual necessity for a high-paying job. This is driving a wedge between the earnings of education "haves" and "have nots." Corporate restructuring is eliminating hundreds of thousands of jobs, many of which belong to professionals and managers, but at the same time it is creating hundreds of thousands of different jobs. Kentucky may have a more serious problem with worker layoffs than other states because a larger share of our workforce is employed in occupations that are not growing quickly and because these workers do not have much success finding new employment after a layoff. Displaced workers may find new opportunities for retraining as technologists and technicians, particularly in the burgeoning health care-related field. This is true even in the most rural areas of the state, which have seen a dramatic increase in technical occupations in recent years.

Skills and Education

Historically, the manufacturing labor force of industrialized nations such as the United States consisted of a small share of highly skilled, decisionmaking managers and a large proportion of assembly line workers who needed only minimal training. Under *Taylorism*, the system of mass manufacturing pioneered by the engineer Frederick W. Taylor, assembly line activities were broken down into their smallest components so that workers faced simple, compartmentalized and highly repetitive tasks. Individual workers did not have to understand how their particular work fit into the creation of the end product, or the objectives of the firm. Formal educational and specific skills requirements under this system were minimal, and the ready availability of mass-produced, inexpensive goods assured high and rising standards of living for workers.

Current workforce training needs are largely the result of fundamental changes in the operation of the U.S. economy. In particular, a shift is underway ". . . from an economy based mainly

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on natural resources and economies of scale made possible by mass production for a large, relatively insulated American market to a more competitive global-information economy where economic success depends mainly on the quality of human resources."[1] As standards of living rise in the United States, consumers increasingly also demand custom-tailored, high-quality and innovative goods and services delivered on a timely basis. According to one technology analyst, "You have to plan for the birth of a new product and for its burial at the same time . . . if you're not planning for both of those events, you're going to lose a lot of money and market share."[2] These forces have led to so-called "diversified quality production"[3] in *high-performance* (HP) workplaces, a concept which is increasingly being adopted by the services sector.

With escalating international competition, American firms faced the choice of (1) upgrading to new production technologies and using highly skilled and productive workers (also known as the "high road"), or (2) keeping old technologies but combining them with less production and lower wage workers in developing countries (the "low road"). According to one estimate, fewer than 5 percent of all American firms had adopted HP forms of work organization in 1992;[4] other sources estimate that perhaps as many as one-third of all manufacturing firms employing over 50 workers now have adopted at least some HP principles.[5,6] Freshwater and colleagues argue that "at present, low-wage, low-skill employment may still provide an opportunity for developing a more highly skilled work force in the future, but the window for this strategy is closing."[7]

While a formal, generally accepted definition of HP practices does not yet exist, common features of HP companies (such as Lexmark, Southwest Airlines, Texas Instruments, Toyota, etc.) include "flexibility, innovation, quality, productivity, customer satisfaction, increased market shares and higher profits."[8] Osterman describes firms' expectations of modern workers as follows: "Today, employees are asked to understand and analyze certain kinds of data, to think about ways to improve the processes and products of the workplace, and to work with others to bring improvements about. No longer is it enough to perform rote tasks on an assembly line."[9]

In a similar vein, Zuboff writes that firms face the choice of automating or informating their workplaces.[10] The first choice leads to "deskilling," whereby workers do (and earn) less over time. In the "informated" workplace, in contrast, front-line workers are empowered to take on increasing responsibilities and decisionmaking. Terms used to describe modern workers include "skilled," "specialized," "flexible," and "possessing interpersonal skills." The latter are required for teamwork, which is becoming increasingly important in organizing labor. Feller notes that workers who are unable to execute certain key activities will be forced to "compete with automation, computerization and voice recognition equipment," with possibly detrimental consequences for their wages.[11]

Modern management methods are based on the realization that "empowered" workers, who carry greater responsibilities, are more content and productive. Also, since front-line workers know more about their particular work processes, they can help the firm gain strategic production

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[1] Glover, R.W. and Marshall, R. (1993, Spring). Improving the school-to-work transition of American adolescents. *Teachers College Record, 94*, 588-610. p. 589.

[2] Quoted in McGraw, D. (1996, July 9). Staying loose in a tense tech market. *U.S. News & World Report*, 46.

[3] Tucker, M.S. (1996). Skills standards, qualification systems, and the American workforce. In L.B. Resnick and J.G. Witt (Eds.), *Linking school and work: roles for standards and assessment* (pp. 23-51). San Francisco: Jossey-Bass Publishers.

[4] Marshall, R., Tucker, M. (1992, October). Building a smarter work force. *Technology Review*, 52-60.

[5] Feller, R. (1996, April). The future of work. *Vocational Education Journal, 71*, 22, ff.

[6] Gephart, M.A. (1995, June). The road to high performance. *Training and Development, 49*, 29-44.

[7] Freshwater, D.F., Wojan, T. & Estes, K. (1996, March). *The future of low-wage, low-skill jobs in rural areas*. (Staff Paper No. 359). Lexington, KY: University of Kentucky, Dept. of Agricultural Economics. p. 13.

[8] Gephart. The road to high performance. p. 31.

[9] Osterman, P. (1994, Autumn). The great American job hunt: Getting started. *Wilson Quarterly*, 46-55. p. 52.

[10] Zuboff, S. (1988). *In the age of the smart machine: The future of work and power*. New York: Basic Books.

[11] These activities include "using a computer to locate, process or communicate information; safeguarding information and valuables; scheduling work activities for oneself; providing information to people; determining the priority of work activities; working with people in other departments to accomplish goals; judging the importance, quality and accuracy of information; coordinating individual work activities with work of others; listening to instructions from or concerns of supervisors or co-workers and responding." Feller. The future of work. p. 26.

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advantages if allowed to participate in decisionmaking. In general, a key criterion for success in this new environment is the ability to match specific workers with specific technologies.[12]

Workplace changes brought about by informating reduce the need for middle management layers, allowing firms to cut overhead costs as exemplified recently by widespread and highly publicized layoffs of white collar workers in some of America's largest corporations. Informating is occurring in many sectors, including financial services, where bank tellers are becoming more broadly trained, not only to cash checks and receive deposits, but also to provide investment advice. Small, self-contained cells of work teams allow computer manufacturer Compaq to respond quickly to changing customer demands, while at the same time raising worker output by 23 percent and improving quality by 25 percent.[13] In automobile manufacturing, independent worker teams make decisions to resolve problems and schedule parts deliveries. In agriculture, farmers use sophisticated information technology to vary fertilizer application rates as they pass through their fields, compensating for variations in inherent soil fertility within fields.

Other innovations, such as the ISO 9000 quality standard, reinforce changes in the workplace. Developed by the International Standards Organization, the ISO 9000 standard involves the implementation of systems designed to assure high quality in production. The standard also requires companies wishing to supply parts to other companies to identify worker training needs in areas where quality improvement is possible.[14] Earning the ISO 9000 standard may become a prerequisite for U.S. firms that wish to export goods and services. The European Community has already adopted this standard.

These workplace innovations are raising the demand for skilled and well-educated workers. While many of the highest paying jobs have always been filled by well-educated workers, many high-paying jobs for people with less education were also available in the past. But in the coming years, nearly all job openings (due to net job creation and replacement of current workers) in occupations paying high wages will require at least some training after high school, and more than half of all job openings in occupations paying high wages will require at least a college degree.

TABLE 14.1
Projected Total Job Openings* by Education Level, 1994-2005
(Numbers in thousands)

Necessary Training	Total	Median Wage of Job Openings		
		Very High or High	Average	Very Low or Low
No special training	15,674	1%	8%	91%
Vocational, formal employer training or other postsecondary	14,247	36%	16%	48%
Bachelor's degree or more	7,603	80%	19%	1%

* Total job openings represent the sum of employment increases and net replacements.
Source: Authors' computations of Bureau of Labor Statistics employment projections and training needs for each occupation

As Table 14.1 shows, of the 15 million job openings which will be available over the next 10 years to workers with only a high school education or less, 91 percent will pay low or very low wages. Workers who participate in vocational training, formal training programs at work, or other postsecondary education will find that almost half of their employment opportunities are for jobs which pay low or very low wages. However, this category of workers includes people with very different training backgrounds. As these workers with some postsecondary training accumulate experience, they may move into higher-paying occupations, even without obtaining a bachelor's degree. Finally, four out of five job openings requiring at least a bachelor's degree pay high or very high wages.

However, Table 14.1 *does not* indicate that four out of five college graduates will have a high-paying job. In 1990, the Bureau of Labor Statistics (BLS) projected that total demand (including job growth, job upgrading, and replacements) for college graduates will grow by 914,000 jobs a

[12] Wirth, A. G. (1992). *Education and work for the year 2000: Choices we face*. San Francisco: Jossey-Bass Publishers.
[13] McGraw, D. (1996, July 9). Staying loose in a tense tech market. *U.S. News & World Report*, 46.
[14] Elliot, C. K. Jr., Shapiro, A. H. (1993, June). Changing U.S. labor force presents new challenges for corporations. *Site Selection*, 618-28.

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year through 2005. BLS also projected supply to grow by 1,320,000 graduates a year. The result is that as many as 30 percent of college graduates in the job market could be in jobs not traditionally requiring a four-year degree, or else they could be unemployed. During the previous decade, about 20 percent of college graduates found themselves "underutilized" or unemployed.[15]

Too few graduates in some fields and too many in others may partly explain why so many college graduates find themselves in jobs not requiring a four-year degree, but Daniel E. Hecker, an economist with BLS, finds that few fields are actually facing shortages.[16] Yet Hecker also reports that the wage premium paid to workers with a four-year degree is higher no matter what the occupation. The median weekly earnings for handlers, equipment cleaners, helpers, and laborers, for example, were $58 higher in 1990 for workers with four years of college than for workers with only four years of high school. If you are a mechanic with four or more years of college, your earnings grew 42 percent between 1983 and 1990; with just four years of high school, your earnings only grew 21 percent.[17]

TABLE 14.2
Median Weekly Earnings of Full-time Wage and Salary Workers by Occupation and Years of School, 1990

	4 years of high school	1 to 3 years of college	4 years of college
Total	$354	$431	$569
Executive, administrative and managerial	$459	$538	$675
Professional specialty	$441	$549	$595
Technicians	$412	$481	$562
Sales	$302	$579	$580
Administrative support, including clerical	$326	$361	$401
Service, except private household	$260	$326	$401
Precision production, craft, and repair	$465	$543	$601
Transportation and material moving	$411	$455	$500
Handlers, cleaners, helpers and laborers	$302	$329	$360

Source: Current Population Survey, cited by Hecker

College is not the only route to getting a job with high wages. Over the next decade, about one third of the expected 14 million job openings for occupations requiring less than a college degree but more than high school will pay high or very high wages. The Bureau of Labor Statistics reports that in 1993, nearly 40 percent of workers with less than a bachelor's degree earned more than $500 per week, and nearly 20 percent earned $700 per week or more.[18] Yet despite the lack of bachelor's degrees, many of these workers have considerable training and experience; some training and certification programs take up to two years to complete. Not everyone must—or even should—attend college, but some sort of postsecondary training will almost certainly be necessary if a person is to have a realistic chance at getting a "good job."

Wage Inequality

The trend toward wage inequality is well documented. Between 1969 and 1993, wages for men in the bottom 40 percent of the earnings distribution fell, and for men in the top 40 percent of the earnings distribution wages rose.[19] The trend was more pronounced in the 1980s and 1990s. Women at all levels of the earnings distribution saw their wages rise between 1969 and

[15] Shelley, K. J. (1992, Summer). More college graduates may be chasing fewer jobs. *Occupational Outlook Quarterly, 36*, 5-11.
[16] Hecker, D. (1992, Summer). College graduates: Do we have too many or too few? *Occupational Outlook Quarterly, 36*, 13-23.
[17] Hecker, College graduates: Do we have too many or too few?
[18] Cosca, T. (1994, Winter). High earning workers who don't have a bachelor's degree. *Occupational Outlook Quarterly, 38*, 38-46.
[19] Burtless, G. (1996, Spring). Worsening American income inequality: Is world trade to blame? *The Brookings Review, 14*, 26-31.

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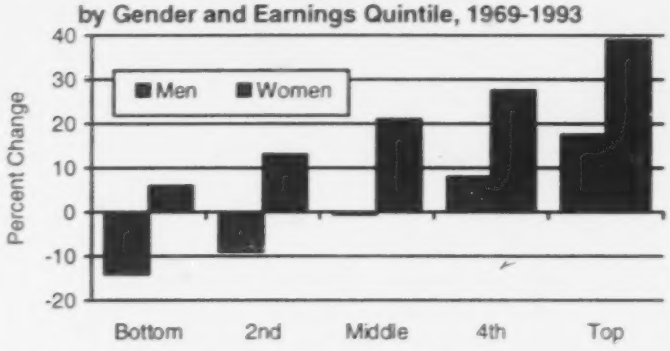
1993, although all of the wage growth for women at the bottom occurred between 1969 and 1979. After 1979, their annual earnings fell.[20]

FIGURE 14.1
Changes in Real Earnings, by Gender and Earnings Quintile, 1969-1993



Source: Data from Bureau of the Census, calculated by Burtless.

The wage disparity has contributed to a growing disparity in personal income. During the 1970s, personal income grew for people at all income levels (but faster for those at the high end). However, real income fell for people in the bottom 60 percent of the income distribution between 1979 and 1993. Gary Burtless of the Brookings Institution writes, "In 1969, income at the 95th percentile of adjusted personal income was a little less than 12 times income at the 5th percentile. By 1993, income at the 95 percentile was more than 25 times income at the 5th percentile."[21]

The news is not entirely bad, however because people are not locked into an income percentile for their entire lives. A 1992 study by the U.S. Department of Treasury, based on 14,351 income tax returns filed from 1979 through 1988, suggests that there is considerable mobility between income levels. Of the people in the lowest income quintile in 1979, 21 percent rose to the second quintile, 25 percent to the middle, 25 percent to the second-highest, and 15 percent moved up to the top quintile. In other words, 86 percent of those in the bottom income quintile in 1979 had managed to raise their incomes by enough to move to a higher quintile by 1988.[22] Still, the gap between the highest and lowest quintiles is much larger today, meaning that people in the lower quintiles have more ground to make up than in 1979.

Technology Growth, Trade, and Immigration

Although numerous explanations have been offered as to why wage inequality has increased, at the center of the debate are two competing theories: one based on technology, the other on international trade and immigration. The former argues that as automation and computerization have grown in most industries, the demand for skilled workers has risen. Because skilled workers are relatively scarce, employers have been forced to bid for these workers by raising their relative earnings. According to the latter, companies employing low-skill labor in the United States have had to either depress wages or eliminate jobs in order to remain competitive, and immigration has enlarged the pool of available low-skill labor, which would also reduce the relative wages of low-skill workers.

Although trade and technology effects are not mutually exclusive, the preponderance of opinion seems to be that technology is a bigger factor than international trade and immigration in skewing wages. Gary Burtless of the Brookings Institution notes that between 1969 and 1993, U.S. industries most affected by trade have eliminated low-skill, low-wage workers *no faster than* the industries least affected by trade. This, he writes, is "a pattern that is extremely hard to square with the claim that foreign trade is the main factor behind soaring wage inequality."[23] In addi-

[20] Burtless. Worsening American income inequality: Is world trade to blame?
[21] Burtless. Worsening American income inequality: Is world trade to blame? p. 28.
[22] Cox, W.M., Alm, R. (1995, December). The good old days are now. *Reason, 27.* [On-line]. Available: www.reasonmag.com/9512/COXfeat.html.
[23] Burtless. Worsening American income inequality: Is world trade to blame? p. 30.

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tion, imports from developing countries represent a small share of gross domestic product, and this share fell in the 1980s, even while the wage gap rose.[24] Two economists at the Federal Reserve Bank of New York concluded that technological progress was the most important influence on wage inequality, while international trade made a more modest contribution to the problem.[25] Finally, Stephen Golub, an economist at Swarthmore College, calculates that unit labor costs (the labor cost of producing a single item) in many low-wage countries are quite close to, or in some cases higher than, unit labor costs in the United States because of much lower worker productivity.[26]

MIT economist Olivier Blanchard describes the high-skill labor market as a race between an increase in relative supply and relative demand. As more people attend college or receive other postsecondary training, the supply of high-skill workers relative to low-skill workers rises and the wage premium paid to high-skill workers decreases because employers don't have to do as much "bidding" for labor. On the other hand, as technology spreads throughout the economy, the demand for high-skill workers relative to low-skill workers rises and employers must compete with each other in order to retain high-skill labor. Blanchard writes, "In the 1970s, relative supply won; in the 1980s, relative demand won. But in both decades, the race has been fast on both sides."[27] Technology growth affects the relative demand for high-skill workers. International trade and immigration affect the relative supply. (As a truly global labor market emerges, the pool of low-skill labor increases, thus reducing the *relative* supply of high-skill labor.) In either case, the trends could lead to a larger wage gap between high- and low-skill workers. Blanchard also warns that employment rates for low-skill workers could decrease significantly in the future if current trends continue.

Corporate Restructuring

Corporate restructuring sounds innovative and bold, yet Americans have come to expect an accompanying elimination of jobs. In 1995, U.S. corporations eliminated 440,000 jobs, bringing the number of jobs cut in the 1990s by U.S. corporations to 2.9 million.[28] The American Management Association reports that the percentage of companies which downsize because of a downturn in business has fallen steadily in the 1990s. More than 40 percent of firms which downsized in 1990 and 1991 cited a business downturn as the sole cause of the downsizing, and another 30 percent said a business downturn was a contributing cause. Today, about 30 of downsizing firms say that a business downturn is a contributing cause, but only 4 percent of firms say it is the sole cause. In contrast, the percentage of firms citing "automation or other new technology" as a reason for downsizing has more than doubled during the 1990s. Also, more than half of downsizing firms cited "reengineering of business processes" and almost two thirds cited "organizational restructuring" as reasons for downsizing.[29]

In other words, hundreds of thousands of workers are losing their jobs today, just as they did during the beginning of the decade. However, they are doing so for different reasons. Many of today's workers are being replaced by other workers who do different jobs, or they are replaced by a computer or other technology. The moral to the story: Going back to work is more than simply a matter of finding the same job with a different employer; today's displaced workers need retraining and may be re-employed in entirely different occupations.

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[24] Solow, R. (1994). Widening wage inequality. *The Urban Institute Policy and Research Report, 25*. [On-line]. Available: www.urban.org/periodcl/prr25_1b.htm.

[25] Brauer, D.A., and Hickok, S. (1995, January). Explaining the growing inequality in wages across skill levels. *Federal Reserve Bank of New York Economic Policy Review*, 1, 61-75.

[26] Koretz, G. (1995a, September 11). The equalizer: productivity. *Business Week*, 26.

[27] Blanchard, O. (1995, January). Macroeconomic implications of shifts in the relative demand for skills. *Federal Reserve Bank of New York Economic Policy Review*, 1, 48-53. p. 48.

[28] Arnst, C. (1996, January 22). Out one door and in another. *Business Week*, 41.

[29] American Management Association. (1996). 1996 *AMA Survey: Corporate downsizing, job elimination and job creation*. [On-line]. Available: www.amanet.org/ama/survey/96survey.htm.

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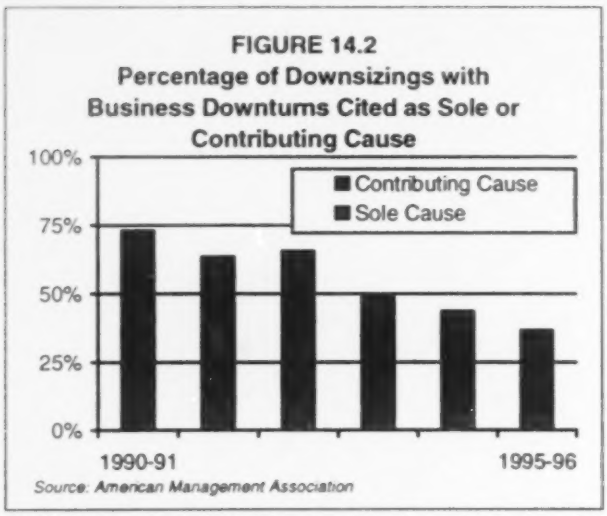

In the past, downsizing usually meant layoffs primarily for blue-collar workers and lower-level white-collar workers, but no longer. When the Chemical Bank and Chase Manhattan Corporation merger eliminated 12,000 jobs and AT&T eliminated 40,000—both in late 1995 or early 1996—many professional and managerial positions were eliminated. According to the U.S. Department of Labor, managerial and professional workers accounted for 24 percent of all permanent layoffs from 1991 to 1993, compared with 13 percent in 1981-1983. Even managers at the top of the pay scale are vulnerable.[30] Of course, blue-collar workers have lost many jobs as well. Rising productivity has enabled output to steadily grow while companies shed workers. Since 1989, manufacturing employment has fallen by half a million jobs.[31] Meanwhile, real manufacturing output is up by about 10 percent.[32]

After downsizing, the fates of white-collar workers and other workers are markedly different. BLS reports that more than 75 percent of white-collar employees who lost their jobs from 1993 to 1995 had found work by February 1996. In contrast, only about 64 percent of low-skill blue-collar workers had found new jobs.[33] Also, past studies have found that when laid-off blue-collar workers find new jobs, the pay averages 20 percent less than the old job.[34] Although more white-collar workers are losing jobs today than in the past, many find good jobs with other companies. Eric R. Greenberg, director of management studies for the American Management Association, observes that "high-priced managers are being replaced with other high-priced managers with different skills."[35] (Arnst). By developing new skills, particularly in the areas of marketing, sales and technical occupations, many well-educated workers are finding excellent new job opportunities.[36]

Corporate restructuring frequently involves outsourcing of some functions and elimination of many titles and positions. Outsourcing means hiring outside firms to do things formerly done inside the company. Functions such as customer relations, data processing, debt collection, advertising, and mailings are commonly outsourced these days, to the extent that employment in business services industries (companies which provide services to other companies) doubled between 1984 and 1994,[37] and employment in the temporary-help industry has risen almost 50 percent since 1990, to 2.25 million in 1994.[38] Often, employees whose jobs have been outsourced are offered jobs doing the same thing for the same company, but in the employ of another firm. And often, these workers are paid less—sometimes much less—and with inferior benefits. As just one example of many, Robert Half International Inc., which supplies temporary workers to businesses, doubled the number of accountants it placed between 1992 and 1995. These temporary

[30] Koretz, G. (1995b, September 11). No letup in U.S. layoffs. *Business Week*, 26.
[31] Arnst, C. Out one door and in another, 41.
[32] Mittelhauser, M. (1994, Fall). Manufacturing: It's still the industrial age. *Occupational Outlook Quarterly, 38*, 26-35.
[33] postsecondary Bureau of Labor Statistics. (1996). *Worker displacement during the mid 1990s*. Washington, DC: Author. [On-line] Available: stats.bls.gov/news.release/disp.toc.htm.
[34] Arnst. Out one door and in another.
[35] As cited by Arnst. Out one door and in another.
[36] Arnst. Out one door and in another.
[37] Bernstein, A., Zellner, W. (1995, July 17). Outsourced—and out of luck. *Business Week*, 60-61.
[38] Bernstein, A. (1995, July 17). The wage squeeze. *Business Week*, 54-63.

white-collar workers are paid 10 percent to 20 percent less than full-time accountants, receive few benefits, and seldom work year-round."[39]

TABLE 14.3
Displaced Workers by Occupation of Lost Job and Employment Status in February 1996

	Total (thousands)*	Employed	Unemployed	Not in the labor force
Total, 20 years old or over**	4,171	73.6%	12.5%	13.9%
Executive, administrative and managerial occupations	701	76.6%	9.2%	14.2%
Professional specialty occupations	466	79.5%	10.9%	9.6%
Technologists and technicians	136	85.7%	7.0%	7.3%
Sales occupations	478	68.2%	16.3%	15.4%
Administrative support occupations, including clerical	722	72.8%	10.5%	16.7%
Service occupations	247	77.0%	11.1%	11.9%
Farming, Forestry and fishing occupations	40	NA.	NA.	NA.
Precision production, craft, and repair occupations	578	80.4%	10.0%	9.6%
Operators, fabricators, and laborers	775	63.8%	18.1%	18.1%

* Data refer to persons who had 3 or more years of tenure on a job they had lost or left between January 1993 and December 1995 because of plant or company closings or moves, insufficient work, or the abolishment of their positions or shifts.
** Total includes a small number who did not report occupation.
Source: Bureau of Labor Statistics.

Some workers who lose their jobs end up self-employed. While it is true that self-employment is often less secure than a salary or wage position, individuals have many more resources than they did a generation ago. With the explosion of new information and communication technology, self-employed people have at their fingertips "the creative power of a factory tycoon of the Industrial Era, and the communications power of a broadcast tycoon of the Television Era," in the words of author George Gilder.[40] Particularly with the emphasis on downsizing these days, more people may try to go into business as independent contractors and consultants.

National and State Comparison

The trends which are altering the nature of work—rising job skill requirements, wage inequality, technological displacement of workers, global trade and immigration, and corporate restructuring—are just as significant in Kentucky as in the rest of the country. Nonetheless, Kentucky, like all states, has its unique characteristics. The age distribution of the populace, education levels, geography, climate, tax laws, and wage rates all affect the types of industries which locate in a particular area, the services demanded by residents, the kinds of jobs workers are capable of doing, and the amount of technological investment in an area. As a result, the industries and jobs in one state will be different from the industries and jobs in another or in the nation as a whole. For example, while less than 22 percent of the nation's workforce is employed in the goods-producing sector of the economy, this sector employs 30 percent of the workforce in Kentucky.

With technology enabling increased automation in the workplace and with the growing demand for outsourced business services, it is not surprising that blue-collar occupations are growing much slower than service and white-collar occupations. By 1994, managerial and professional specialty occupations had nearly equaled blue-collar occupations as a share of na-

[39] Bernstein. The wage squeeze.
[40] As cited in Leyden, P. (1996). George Gilder, economist and author. *On the edge of being digital.* [On-line] Available: www.startribune.com/digage/gilder.htm.

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tional employment; each accounted for roughly one in four jobs in the United States. In Kentucky, blue-collar occupations represent about 32 percent of the workforce, while managerial and professional specialty occupations account for only 20 percent. Thus workers with less education may have proportionately more opportunities for higher wage jobs in Kentucky than elsewhere. Conversely, highly educated workers have proportionately fewer high-wage job opportunities in Kentucky.

Employment shares in Kentucky and the nation appear to be changing at approximately the same rate. Occupational employment projections for 2005 (see Table 14.5) suggest that managerial and professional specialty occupations will continue to increase their share of employment nationally, while the share of jobs in traditional blue-collar occupations declines. Kentucky should mirror the national trends. However, blue-collar occupations will still comprise a significantly larger share of total employment in Kentucky than managerial and professional specialty occupations (29.6 percent versus 20.8 percent). Unless Kentucky's industrial composition (discussed in the previous chapter) changes dramatically, it is likely that Kentucky will have an above-average share of its jobs in blue-collar occupations for many years to come. Nonetheless, Kentucky mirrors the United States in terms of occupational *growth*: managerial and professional specialty occupations are growing considerably faster than blue-collar occupations.

BLS predicts rapid growth in service occupations in the next decade. Service occupations include food preparation, child care, law enforcement and fire fighting, housekeepers and health service occupations such as nursing aides and occupational therapy aides. Service occupations do not, however, include most people who work in "business services" industries, such as accounting, data processing, and law. Most people in those industries are classified as either technicians or professional specialists. Thus, most of the jobs in the high-growth category of service occupations are lower paying ones. Service occupations in health care are expected to be among the fastest growing.[41] BLS predicts that the increase in health service occupations between 1994 and 2005 will be three times the increase between 1983 and 1994.

Growth of the health care industry should also boost employment for technicians and related technical support occupations. Health technicians will account for 70 percent of the growth in the total number of technicians between 1994 and 2005.[42] The growing health care industry may affect Kentucky's workforce more than the nation's. Between 1987 and 1994, health technicians and technologists (a sub-category of technicians and technologists) increased employment by 54 percent in Kentucky, and the Department for Employment Services projects a 30 percent increase between 1994 and 2005.[43] Growth has been especially high in some rural parts of the state. Yet with less than 5 percent of total employment, technicians and related support occupations will remain rather small compared to other occupational groups.

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[41] Silvestri, G.T. (1995, November). Occupational employment to 2005. *Monthly Labor Review*, 118, 60-87.
[42] Silvestri. Occupational employment to 2005.
[43] Kentucky Department for Employment Services. (1996). *Kentucky occupational employment outlook and job openings, 1994 to 2005*. Frankfort, KY: Author.

TABLE 14.4
National and State Employment
by Major Occupational Group, 1994 and 2005

	United States		Kentucky	
Total, All Occupations	1994 127,014,000	2005 144,708,000	1994 1,744,770	2005 2,046,431
	Percent of Workforce		Percent of Workforce	
	1994	2005	1994	2005
Executive, administrative and managerial occupations	10.2	10.4	8.0	8.0
Professional specialty occupations	13.6	15.5	11.9	12.8
Technologists and technicians	3.5	3.7	3.2	3.4
Sales occupations	11.0	11.4	11.9	12.4
Administrative support occupations, including clerical	18.2	16.7	15.0	14.0
Service occupations	15.9	17.2	15.8	16.9
Farming, Forestry and fishing occupations	3.0	2.5	3.4	2.8
Precision production, craft, and repair occupations	11.1	10.3	11.5	11.0
Operators, fabricators, and laborers	13.5	12.4	19.4	18.6

Source: U.S. Bureau of the Census and Kentucky Dept. for Employment Services

Rural-Urban Comparison

Just as industries and occupations differ from state to state, so, too, do they differ from county to county. Rural areas in Kentucky have, as one might expect, more people employed in farming, forestry and fishing occupations, while urban areas have more engineers, lawyers and other professional occupations. Figure 14.2 compares the size of occupational groups in urban and rural counties in Kentucky.[44] Occupational groups which fall along the diagonal line hold the same share of total employment in urban and rural counties; groups above the line comprise a larger share of employment in rural counties and groups below the line comprise a larger share of employment in urban counties. The group farthest above the line is operators, fabricators and laborers (Group H)—blue-collar occupations which generally require few skills and pay low wages. In 1990, 24 percent of the rural workforce was employed in this occupational group, compared to only 16 percent of the urban workforce. Rural areas also have a higher percentage of precision production, craft and repair occupations (Group C), which are higher paying, higher skilled blue-collar occupations. On the other hand, the highest paying, highest skilled jobs—executive, administrative and managerial occupations (Group E) and professional specialty occupations (Group G)—account for a significant share of employment in urban areas. These occupations comprise a smaller share of employment in rural areas.

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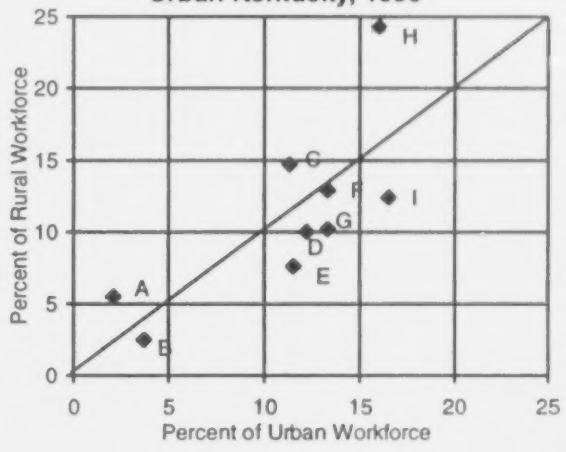
[44] There are many ways of classifying counties on a rural-urban scale. If the U.S. Bureau of the Census includes a county in a metropolitan statistical area (MSA), we classify it as urban. Otherwise, we classify it as rural.

FIGURE 14.3
Occupational Groups in Rural and Urban Kentucky, 1990



Key

A: Farming, forestry and fishing occupations
B: Technicians and related support occupations
C: Precision production, craft and repair occupations
D: Sales occupations
E: Executive, administrative, managerial occupations
F: Service occupations
G: Professional specialty occupations
H: Operators, fabricators, handlers, and laborers
I: Administrative support occupations, including clerical

Source: Data from U.S. Bureau of the Census

From 1980 to 1990, the growth rates for certain occupational groups were quite similar in urban and rural counties. Technicians and related support occupations, sales occupations, and professional specialty occupations grew at about the same rates in rural and urban counties. What makes the similarities in occupational growth rates remarkable is the fact that aggregate population in urban counties increased while in rural counties it fell.

But beneath the similarities in growth rates for some occupational groups, differences—big differences—exist. In sales occupations, for example, jobs increased just as fast between 1980 and 1990 in rural counties as in urban counties, yet cashiers accounted for 43 percent of the new sales occupations in rural counties and only 23 percent in urban counties. The rest of the new sales jobs went to supervisors and proprietors of sales companies, sales representatives for commodities and finance, and other sales occupations. Professional specialty occupations also increased at approximately the same rate in urban and rural counties, yet engineers and natural science occupations (which is a sub-category of professional specialty occupations) grew 22 percent in urban counties and only 2 percent in rural counties. Urban counties also had a significantly faster increase in the number of doctors, dentists and other health diagnosing occupations (another sub-category of professional specialty occupations).

Perhaps nowhere is the contrast between rural and urban counties more apparent than in the growth of service occupations and executive, administrative and managerial occupations. Between 1980 and 1990, rural counties had 60 percent of the state's new service occupations but only 30 percent of the state's new executive, administrative and managerial occupations.

The Future of Work in Kentucky

Clearly, there are fundamental changes at work in the economy. High-skill workers are highly valued, and their earnings reflect that. Wages are growing more unequal. As technology and trade compel corporations to restructure and enable manufacturing to produce more goods with fewer workers, business services and personal services are growing quickly. What does all of this mean for the future of work?

The spread of technology has made professional and technical workers increasingly productive and, as MIT economist Olivier Blanchard notes, has increased the relative demand for these workers faster than the relative supply. On the other hand, trade and technology are working to shrink manufacturing employment while personal services industries boom. Thus less-skilled workers must increasingly seek employment in service occupations, which do not pay nearly as well as many of the blue-collar production jobs they replace. The result: bipolar wage growth. Well-educated workers are earning more, and less educated workers are earning less.

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This is obvious when we look at occupational employment growth. In Kentucky and the rest of the nation, professional specialty occupations and service occupations are expected to be the two fastest growing occupational categories. In Kentucky, two out of every five new jobs will be in one of these two categories. Nationally, more than half of all new jobs will be in one of the two categories. Yet professional specialty occupations and service occupations are at opposite ends of the education and skills spectrum. Almost all professional occupations require at least a four-year college degree. Conversely, very few service occupations require postsecondary training, and many jobs require little training whatsoever. Professional specialty occupations also pay much better wages than service occupations.

Marketing and sales occupations will provide about 15 percent of all new jobs in Kentucky and the nation. Many of these occupations pay good wages, and they do not necessarily require extensive schooling or training after high school. Thus, less educated workers may wish to seek employment in sales and marketing. In other occupational categories, Kentucky's executive, administrative and managerial occupations are projected to account for 8.5 percent of all new jobs over the next decade, versus 12.3 percent of new jobs nationally. Blue-collar production occupations are projected to account for 22.3 percent of all new jobs in Kentucky, compared to only 9 percent nationally. Kentucky, like the nation, is projected to have a decline in agricultural occupations.[45]

Technological advances and global trade will put special pressure on states like Kentucky with fewer college graduates and less income. In the past, many kinds of business and personal services had to be based close to the customers, but technology has eliminated many spatial requirements for businesses. Today, companies and individuals can provide instruction, legal services, and even medical care from remote sites. And high-growth companies such as software developers can locate almost anywhere. States with a well-educated populace and a state-of-the-art communications infrastructure will likely be the states with the most competitive business services industries.

Meanwhile, international trade affects some industries intensely, even though its impact on the nation's economy overall may be small (some contend it's quite significant). One such industry affected by trade is apparel manufacturing, which also happens to be the largest manufacturing employer in rural Kentucky. As apparel manufacturing moves to Latin America and Southeast Asia, job loss here could be significant. Thus Kentucky finds itself facing tough competition for high-skill business service jobs, which offer the best new high-wage opportunities, and tough competition for low-skill production jobs, which provide employment for many thousands of Kentuckians.

Corporate restructurings can hurt all workers, but white-collar workers tend to fare better in the aftermath. A number of white-collar employees who are downsized out of a job land on their feet by starting their own consulting or business service company. How do they do it? With a computer and a modem. Others learn new skills and go to work for another company, often at or near their previous salaries. Blue-collar workers typically don't do as well. Because we have an above-average share of blue-collar workers and a below-average share of white-collar workers, more Kentuckians may have to settle for lower wages or part-time jobs after their companies downsize.

The future is not necessarily grim, however. Nicholas Negroponte, the founder and director of the Media Lab at the Massachusetts Institute of Technology, believes that the digital age "has four very powerful qualities that will result in its ultimate triumph: decentralizing, globalizing, harmonizing and empowering," despite the fact that he also foresees added invasions of privacy, data thievery, and, worst, widespread job loss and the disappearance of lifetime employment.[46] The very technology which increases competition for Kentucky businesses can also bring untapped opportunities, particularly for rural areas which now have access to potential customers

[45] Kentucky Department for Employment Services. *Kentucky occupational employment outlook and job openings, 1994 to 2005.*

[46] Negroponte, N. (1995). *Being digital.* [On-line] Available: www.obs-europa.de/obs/english/books/nn/ch19epi.htm.

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hundreds or even thousands of miles away. More and more professionals may choose to live in rural areas and do their work at home. The new technology may also make it much easier for people to learn new skills and to continuously upgrade old ones. Jeremy Rifkin points out that those people who do not have private-sector jobs may redirect their energies toward non-profit organizations and charities.

To ensure that Kentucky will not just survive but thrive in the new economy, it is essential that workers and businesses across the community have modern hardware and software which allow them to work and learn and conduct business over the Internet. Furthermore, college and other postsecondary education is absolutely essential.[47] Some high-paying jobs require relatively few skills, but they are scarce. For workers with no special training beyond an ordinary high school diploma, 9 out of 10 job openings during the coming decade will pay low or very low wages. And workers may simply have to get accustomed to less job security. Skill requirements are continuously rising, contingency employment is growing dramatically and fewer businesses offer non-wage benefits.[48] Those workers who will thrive in the future will be those with the personal skills, temperament, and expectations of what it takes to succeed in a more fluid work environment.

[47] See "Workforce Training Issues" in Section 2 of this volume for a discussion of workforce development trends and needs.
[48] See "Renegotiating the Social Contract" in Section 3 of this volume for a discussion of the changing employer-employee contract.

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